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L12: Entry 3 of 3

File: USPT

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TITLE: Preparation of permselective composite membrane

Brief Summary Text (74):

The term "aprotic polar organic solvent", as used in the present specification and the appended claims, denotes an organic solvent which does not contain active hydrogen and has a strong polarity. Examples of such a solvent are amides such as N-methylpyrrolidone, N-methylcaprolactam, N,N-dimethyl formamide, N,N-dimethyl acetamide and hexamethylphosphoramide; urea derivatives such as tetramethyleneurea; organic sulfoxides such as dimethyl sulfoxide; and organic sulfones such as tetramethylene sulfone. Of these, N,N-dimethyl formamide and dimethyl acetamide are especially suitable. These aprotic polar solvents may be used singly or as a mixture of two or more.

Detailed Description Text (6):

The solution was poured into water, and the precipitate was thoroughly washed and dried to afford a reddish orange powder. This polymer had an inherent viscosity (ρ_{inh}) of 1.00, and was soluble in amide-type solvents such as N-methyl pyrrolidone, N,N-dimethyl acetamide, or dimethyl formamide, dimethyl sulfoxide, tetramethylene sulfone, nitrobenzene, tetramethyleneurea, and pyridine.

Detailed Description Text (40):

A Dacron non-woven fabric (basis weight 180 g/m²) was fixed on a glass plate. Then, a solution containing 20.0% by weight of polysulfone, 15.0% by weight of methyl Cellosolve and the remainder being dimethyl formamide was cast onto the fabric in a layer having a thickness of about 0.2 to 0.3 micron. Immediately, the polysulfone layer was gelled in a room temperature water bath to form a non-woven fabric-reinforced microporous polysulfone membrane.

Detailed Description Text (46):

The polysulfone supporting membrane (PS-1), cut to a square shape with each side measuring about 10 cm, was placed on a well-polished glass plate or metal plate so that its backing contacted the plate. Then, each side of the membrane was fixed by an adhesive tape. A 2% by weight aqueous solution of sulfuric acid was poured onto the fixed supporting membrane, and cast in one direction by using a glass rod. The aqueous sulfuric acid solution on the surface was scraped off, and the glass plate or metal plate was caused to stand perpendicular. After leaving it as it was for 5 minutes to drain the remaining aqueous sulfuric acid solution, the coated glass or metal plate was heated in an oven (through which air was passing at a speed of 3.5 m/sec.) for 10 minutes at the same temperature as that used in preparing the PBIL composite membrane. The resulting membrane will be referred to herein as PS-3. This polysulfone membrane had a thickness of 30 to 130 microns, and a membrane constant of 1.20 to 1.75.times.10⁻⁴ g/cm² .multidot.sec.multidot.atm.

Detailed Description Text (48):

In a manner similar to the preparation of PS-3, the PS-2 membrane was heat-treated at a predetermined temperature for a predetermined period of time without using an aqueous solution of sulfuric acid. The resulting membrane will be referred to hereinbelow as PS-4. The polysulfone membrane generally had a membrane constant of 2.times.10⁻⁴ to 10⁻⁶ g/cm² .multidot.sec.multidot.atm.multidot.

although varying according to the treating temperature.